

38th Annual Meeting, APS Division of Plasma Physics

11-15 November 1996, Denver, CO

Abstract Submittal Form

Deadline: Wednesday, 10 July 1996

Subject Classification Category _____

☐ Theory

☐ Experiment

(Refer to the DPP Subject Category list on page M19.)

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Investigation of the Conversion of Laser Energy to

Relativistic Electrons at Intensities of 10^{20} W/cm²

K. Wharton, Y. Zakharenkov, C. Brown, B. Hammel, C. Joshi, J. Moody, A. Offenberger, M. Perry, S. Wilks, and V. Yanovsky, Lawrence Livermore National Laboratory Livermore, CA 94550

We report on experiments using the 100 TW laser at LLNL (40J, 400fs, 10^{20} W/cm² focal intensity) and planar multi-layer targets (Mo/Sn) to study the generation and transport of electrons with MeV energies. Such fast electrons are of prime importance to many proposed applications, e.g., the fast ignitor fusion concept. X-ray emission spectroscopy is used to study the electron transport. Characteristic K- α photon emission produced by the fast electrons in the front (Mo) and rear (Sn) layers of the target is measured with a CCD detector (single photon counting mode) to infer the electron energy deposition. The electron energy spectrum is measured by varying the thickness of the Mo layer to attenuate the electrons by different amounts. In addition, penumbral imaging of the K- α emission is used to give information about the angular distribution of the fast electron emission. Comparisons with monte-carlo simulations reveal a broad high-energy electron spectrum, containing over 10% of the incident laser energy. *Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under contract number W-7405-ENG-48.

- ☐ Prefer Poster Session
☐ Prefer Oral Session
☐ Place in the following grouping:
(Specify the order)

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A faxed copy is NOT acceptable. This form, or a computer-generated form, plus ONE COPY, must be received by Wednesday, 10 July 1996 at the following address.

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